

IN THE CLAIMS:

Please Cancel claims 1-16, without prejudice.

Claims 17 and 18 have been withdrawn.

Add claims 19 - 30 as follows:

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On

1 19. (New) An optical interconnect structure with
2 integral reflective surface and lens comprising:
3 a substrate;
4 a plurality of waveguides formed on said substrate,
5 each of said waveguides having a cylindrical lens formed on at
6 least one end thereof; and
7 a plurality of reflective structures formed of the same
8 material as the substrate and integral with said substrate,
9 each reflective structure having a reflective surface optically
10 aligned with a corresponding one of the plurality of
11 waveguides, the structure configured to reflect light between
12 the waveguides and a plurality of optoelectronic devices
13 attached to the substrate.

1 20. (New) An optical interconnect structure as in
2 claim 19, wherein the radius of curvature (R) of the cylindrical
3 lenses is selected in accordance with a formula expressed as
4 follows:
5

5
$$1/f = (u-1)/R$$

6 "f" being the focal length of the lens; and

7 "u" being the refractive index of the waveguide.

1 **21. (New)** An optical interconnect structure with
2 integral reflective surface and lens comprising:

3 a monocrystalline substrate;

4 a plurality of waveguides formed on said substrate,
5 each of said waveguides having a cylindrical lens formed on at
6 least one end thereof;

7 a plurality of reflective structures formed of the same
8 material as the substrate and integral with said substrate,
9 each reflective structure having a reflective surface at an
10 angle determined by the crystalline plane of the
11 monocrystalline material and optically aligned with a
12 corresponding one of the plurality of waveguides, the structure
13 configured to reflect light between the waveguides and a
14 plurality of optoelectronic devices attached to the substrate.

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1 **22. (New)** An optical interconnect structure as in
2 claim **19** wherein said substrate comprises silicon.

1 **23. (New)** An optical interconnect structure as in
2 claim **22**, wherein said reflective structures have their reflective
3 surfaces formed at an angle of approximately 125 degrees.

24. (New) An optical interconnect structure as in claim **19**, wherein said optoelectronic device is a vertical cavity surface emitting laser.

25. (New) An optical interconnect structure with integral reflective surface and lens comprising:

a substrate;

a plurality of tapered waveguides formed on said substrate, each of said tapered waveguides having a cylindrical lens formed on at least one end thereof; and

a plurality of reflective structures formed of the same material as the substrate and integral with said substrate, each reflective structure having a reflective surface optically aligned with a corresponding one of the plurality of tapered waveguides, the structure configured to reflect light between the waveguides and a plurality of optoelectronic devices attached to the substrate.

26. (New) An optical interconnect structure as in claim **25** herein the radius of curvature (R) of the cylindrical lenses is selected in accordance with a formula expressed as follows:

$$1/f = (u-1)1/R$$

"f" being the focal length of the lens; and

"u" being the refractive index of the waveguide.

1 27. (New) An optical interconnect structure with
2 integral reflective surface and lens comprising:

3 a monocrystalline substrate;

4 a plurality of tapered waveguides formed on said
5 substrate, each of said tapered waveguides having a
6 cylindrical lens formed on at least one end thereof;

7 a plurality of reflective structures formed of the same
8 material as the substrate and integral with said substrate, each
9 reflective structure having a reflective surface at an angle
10 determined by the crystalline plane of the monocrystalline
11 material and optically aligned with a corresponding one of the
12 plurality of tapered waveguides, the structure configured to
13 reflect light between the waveguides and a plurality of
14 optoelectronic devices attached to the substrate.

1 28. (New) An optical interconnect structure as in
2 claim 27 wherein said substrate comprises silicon.

1 29. (New) An optical interconnect structure as in
2 claim 28, wherein said reflective structures have their reflective
3 surfaces etched at an angle of approximately 125 degrees.

1 30. (New) An optical interconnect structure as in
2 claim 27, wherein said optoelectronic device is a vertical cavity surface
3 emitting laser.